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AUTHOR Stone, David Edey
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IDENTIFIERS *Direction Following; *The Research Instruments Project

ABSTRACT

Designed to assess how people read and comprehend information presented in picture-text amalgams in procedural texts, this instrument presents various combinations of text information and illustrative information on slides. Subjects are assigned to one of four conditions and directed to follow the instructions presented on the slides. Videotapes are used to determine (1) whether the reader was looking at a slide of text, at an illustration, or at model parts; (2) how long the reader's eyes were in each of these three positions; (3) how often the reader looked at each of these three positions; and (4) the sequence in which the reader looked at them. (This document is one of those reviewed in The Research Instruments Project (TRIP) monograph "Measures for Research and Evaluation in the English Language Arts, Volume 2," published by the Committee on Research of the National Council of Teachers of English in cooperation with the ERIC Clearinghouse on Reading and Communication Skills. The TRIP review, included here as an introduction to the instrument, describes the instrument's category (reading), title, author, date, age range (postsecondary), purpose, and physical characteristics.) (JL)

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ED236665

Test of Picture-Text Amalgams in Procedural Texts.

The measurement instruments contained in this document have been reviewed in a monograph (cited below) edited by William T. Fagan, Charles Cooper, and Julie Jensen, for The Research Instruments Project (TRIP), and funded by a grant from the Trustees of the NCTE Research Foundation:

Measures for Research and Evaluation
in the
English Language Arts
Volume II

The purpose of the editors has been to select and review measurement instruments pertaining to all aspects of research and evaluation in the English language arts, e.g. language and language development, literacy, literature, reading (including comprehension, teacher-pupil interaction, etc.), writing, and teacher knowledge and attitudes. In order to make some of the actual instruments reviewed more readily available, the ERIC Clearinghouse on Reading and Communication Skills (ERIC/RCS) has cooperated with the editors by processing selected instruments into the ERIC system (see the 42 documents assigned Clearinghouse accession numbers CS 207 904-945).

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CS 207940

Category: Reading

Title: Test of Picture-Text Amalgams in Procedural Texts.

Author: David Edey Stone

Age Range: Post secondary

Description of the Instrument:

Purpose: To assess how people read and comprehend information presented in picture-text amalgams in procedural texts.

Date of Construction: 1977

Physical Description: Although some research is available on the impact of illustrations on the comprehension of narrative texts, the opposite is true with regard to procedural texts. Since people are frequently confronted with completing tasks through the aid of illustrations, this test was considered to fill an important need.

The task chosen for use was selected from the Fishertechnik 100 model kit. The particular model used is the loading cart.

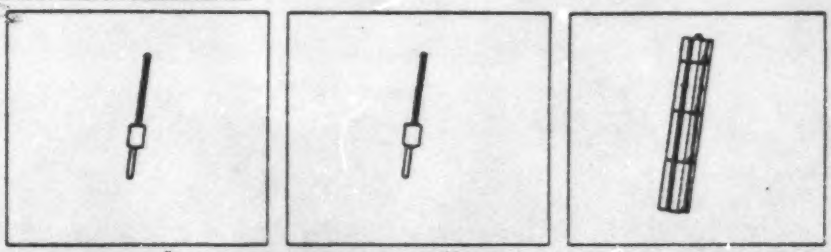
Slides containing various combinations of text information and illustrative information were prepared; subjects were assigned to one of four conditions and directed to follow the instructions presented on the slides. Through the use of videotapes, the following reading behaviours were observed: whether the reader was looking at a slide of text, at an illustration, or at model parts; how long the reader's eyes were in each of these three positions; how often the readers looked at each of these three positions; and the sequence in which the readers looked at them.

The first three steps of the text directions and the first three slides are presented below:

Text Directions

1. To form handle one: Insert a short rod through a clip so that the clip is in the middle of the rod.
2. To form handle two: Insert another short rod through another clip so that the clip is in the middle of the rod.
3. To form column one: Assemble one small block and three large blocks end to end.

Illustrations 1, 2, 3



Validity, Reliability, and Normative Data:

A categorization system for tasks was developed and used as a guide for constructing the task directions. Four categories were identified: dimension, sequential constraints, number of substates, and the information present at the conclusion of the task concerning its preceding substates and their sequence.

The initial step in preparing the text directions involved having several people observe the performance of the task and record in writing what they observed. The task was performed very slowly so that ample time would be available for recording any aspects of the event deemed to be important.

The line drawings were prepared on a PDP 11 computer graphics system and were designed to closely approximate the pictorial directions in the manual of instructions for the model used. The graphics system used makes it possible to easily duplicate all or part of an existing drawing. This method of producing stimulus materials insured that the only differences in illustrations and text used would be those called for in the design of the experiment. For example, a line drawing representing a handle is constant regardless of whether it is shown singly or in combination with other parts.

On the basis of three pilot studies, appropriate changes were made until the task was considered appropriate for its purpose.

No reliability data for the subjects' completion of the task are reported.

In general, results of the study conducted with 60 subjects enrolled in an introductory psychology course showed that the addition of text resulted in a reduction in the amount of time spent looking at illustrations. The addition of text also resulted in more rapid and accurate task performance.

Related Documents:

Stone, David Edey. Comprehension of information in picture-text amalgams in procedural texts. Unpublished doctoral dissertation, Cornell University, 1977.

APPENDIX A

TEXT DIRECTIONS

To form handle one: Insert a short rod through a clip so that the clip is in the middle of the rod.

To form handle two: Insert another short rod through another clip so that the clip is in the middle of the rod.

To form column one: Assemble one small block and three large blocks end to end.

For form column two: Assemble another small block and three other larger blocks end to end.

To form the back: Move the columns so that they are parallel with each other. They should be about the width of two blocks apart. (Be sure that the tabs at the end of each column point in the same direction.)

Connect the two columns by inserting four flat pieces between them. Slide each flat piece into place using the side grooves in the blocks. (All the flat pieces should have their smooth sides on the same side.) They must be flush with the ends of the columns without tabs.

To form the axle assembly: Insert the long rods through two angle blocks. The angle blocks should be oriented in the same way and should be about two blocks widths apart.

To attach the axle assembly to the back: Insert the tabs of the angle blocks in the end grooves of the columns. Be sure that the angle blocks are oriented in the same way and that one tab on each angle block faces the side of the back with smooth flat pieces.

To form the base: Fasten two large blocks end to end to form a short column. Attach a third large block to a flat piece by inserting the flared edge of the flat piece into a side-groove of the block. (Be sure that the ends of the flat piece are flush with the ends of the block.)

Attach another large block to the other flared edge of the flat piece in the same way. (Be sure that the tabs of the blocks point in the same direction.) Insert these two tabs into a side groove of the short column so that the side of the short column covers the ends of both large blocks and the end of the flat piece.

To attach the base to the axle assembly: Notice that the base has a column of two large blocks. One side of this column has a flat piece attached to it. Attach the opposite side of this column to the exposed tabs of the axle assembly. Be sure that the flat piece in the base has its smooth side up.

To form a wheel assembly: Place a washer over one end of the long rod so that it is flush with the angle block. Place a nut hub over the same end of the long rod so that its threads point away from the angle block.

Next place a tire over the same end of the rod. Next place a screw hub over the same end of the long rod with its threads toward the nut hub. Screw the nut hub and screw hub together with the tire between them. Finally, place a washer over the same end of the long rod so that it is flush with the screw hub.

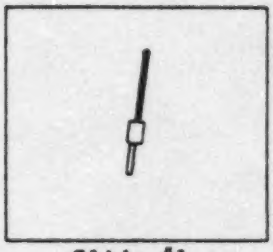
To form another wheel assembly: Place a washer over one end of the long rod so that it is flush with the angle block. Place a nut hub over the same end of the long rod so that its threads point away from the angle block.

Next place a tire over the same end of the rod. Next place a screw hub over the same end of the long rod with its threads toward the nut hub. Screw the nut hub and screw hub together with the tire between them. Finally, place a washer over the same end of the long rod so that it is flush with the screw hub.

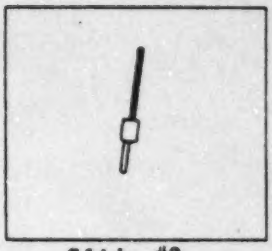
Next, the handles should be inserted in the end of the back with exposed tabs. Each handle should be inserted in the grooves at the front of the back so that the clips are resting against the ends of the blocks. The openings on one side of each clip should fit over the tabs at the ends of the columns. This completes the assembly of the loading cart.

APPENDIX B

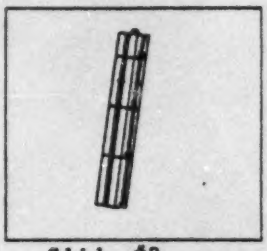
SLIDES OF ILLUSTRATION
(Not shown in accurate scale)



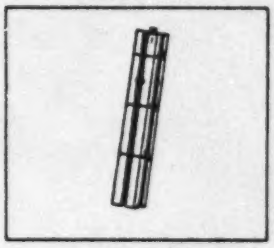
Slide #1



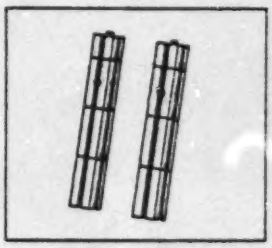
Slide #2



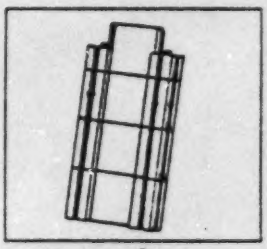
Slide #3



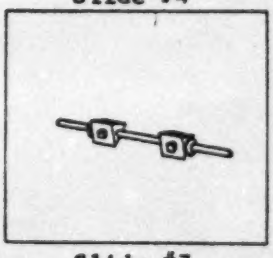
Slide #4



Slide #5

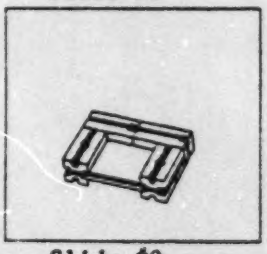


Slide #6



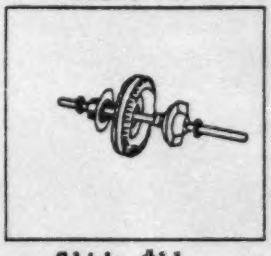
Slide #7

Slide #8



Slide #9

Slide #10

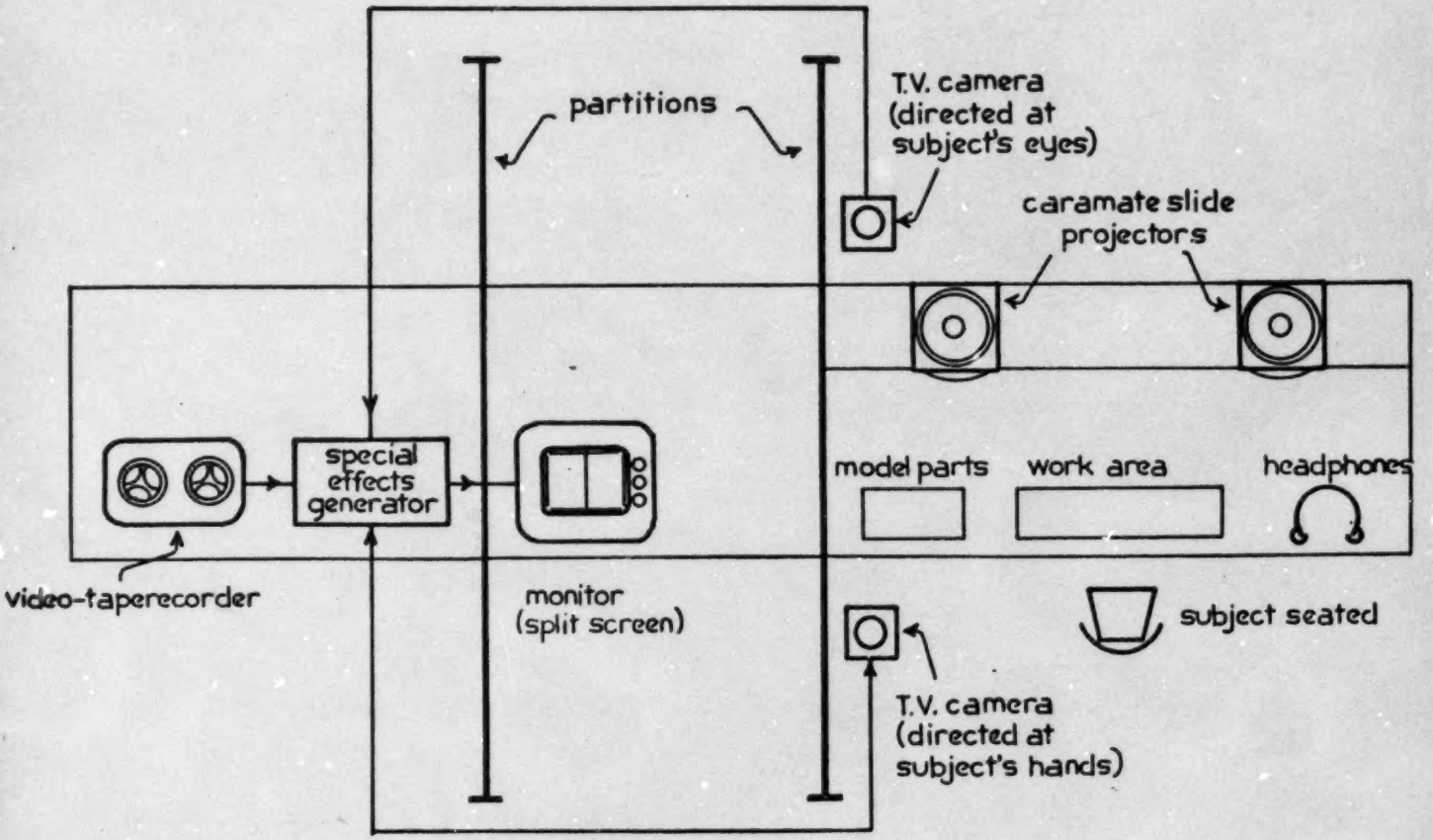


Slide #11

Slide #12

APPENDIX C

PHYSICAL LAYOUT OF THE RESEARCH LABORATORY



APPENDIX D

GENERAL DIRECTIONS FOR THE EXPERIMENT

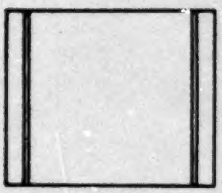
This is an experiment designed to help us learn more about how people read and follow directions. During the experiment you will be asked to examine directions presented on the screen. You should follow these directions as soon as they appear. They will tell you how to assemble a model. Your speed and accuracy are very important.

In order to help you understand the directions you must learn the names of each of the eleven kinds of parts used to assemble the model. You must learn, too, the names of some of the features of these parts.

In order to help you learn these names a display has been prepared showing each part and its name. Study this until you have learned to match each part with its name. You will be given a short test on this information when you are ready. If you should make any mistakes you will be given a chance to try again until you know all the names.

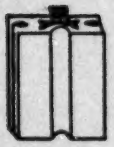
APPENDIX E

PARTS DISPLAY

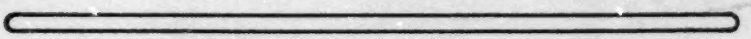


Flat piece

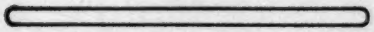
Large block



Small block

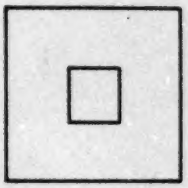


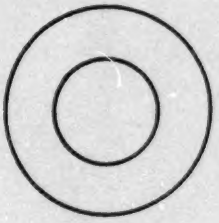
Long rod



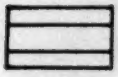
Short rod

Angle block

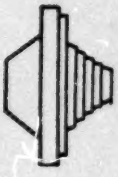




Tire



Clip



Screw hub

Nut hub

Washer

APPENDIX F

METHOD OF RECORDING AND CODING EXPERIMENTAL DATA

The results section of this thesis contains the data derived from an analysis of the videotapes used to record subject's reading behavior and task performance. The method used to extract the data from the tapes was to view each tape on a videotape recorder equipped with a pause button. The subjects' reading behavior, in the form of looking for various periods of time at each of the three screens or at the task was recorded by starting the tape and a stopwatch at the beginning of the task and stopping both at each change in reading behavior. The element of error produced by reaction time was present, but constant throughout the scoring process.

In this manner a record of reading behavior was produced which recorded the duration and sequence of the subjects' looking at text, illustration, or task. Subsequent analysis of this data yielded information as to the frequency with which subjects' looked at one source or the other.

As noted earlier in the thesis, the movement of the subjects' heads and eyes from one position to another was constantly recorded by one of the two television cameras. This movement was completely unambiguous, since positioning of the two slide protectors and the parts for the task was widely separated. This lack of ambiguity was confirmed by disinterested observers.

Although data on the completion time of each subassembly was collected, it has not been analyzed or reported in this thesis. Such data, is to some extent, subject to variation depending on the observer's judgment as to the completion time for a given subassembly. If such data is to be analyzed and reported at a later date an independent observer will be required to furnish the data necessary for a determination of inter-rater reliability.

The following pages contain information concerning the manner in which subassemblies were numbered, the coding for personal data on each subject, their field of study, and the manner in which the data were recorded on reading behavior and task performance.

Subassemblies are numbered as follows:

1 Handle 1
2 Handle 2
3 Column 1
4 Column 2
5 Back
6 Axle assembly
7 Back and axle assembly
8 Base
9 Base, back, and axle assembly
10 Wheel assembly number one
11 Wheel assembly number two
12 Insertion of handle one in back
13 Insertion of handle two in back

Contents of each file consist of:

Subject No.
Sex (0 = male, 1 = female)
Age
Year (1 Freshman, 2 sophomore, 3 Junior, 4 Senior, 5 Graduate Student)
Field
Cell
Score 1
Score 2
Data

Field of study is coded as follows:

0 Undecided
1 Agriculture
10 Horticulture
11 Communication Arts
12 Wildlife Biology
13 Food Science
14 Food Analysis
15 Agricultural Engineering
16 Animal Science
17 Pre-vet
18 Acquatic Science
19 Pomology
101 Ornamental Horticulture
102 Agricultural Education
103 Environemtnal Conservation
104 Ecology
105 Education
106 Natural Resources

2 Arts and Sciences
21 Biochemistry
22 Biology
23 Neurobiology
24 Sociology
25 Fine Arts

3 Engineering
31 Chemical Engineering
32 Civil Engineering
33 Electrical Engineering

4 Human Ecology
41 Social Work
42 Consumer Economics
43 Apparel Textile Design
44 Nutritional Sciences

Data is stored in the following form:

. # . # . # . # .

#/# . # / # . # . # . #

Numbers between the first and second periods are deleted in cells 1-3

The "." indicates a change in activity by the subject. Activities are always presented in the sequence: subject looks at slide of illustration, subject looks at slide of text, subject looks at hands. The number in each of the activity positions refers to the number of seconds the subject engaged in the particular activity. A zero in an activity slot indicates that the subject did not engage in that activity but went on to the next activity listed.

The "/" indicates that the subject changed a slide of text or illustration. If the "/" appears before the first "." on a line of data, then the slide was of illustration, if after the first "." then it was a slide of text.

For cells 1-3 of the design, if a third number appears on a line of data, then this indicates that a subassembly has been completed. If there is no number following this number the subassembly has been correctly completed. If a number does follow, then an error of a particular type has been committed. See the coding for assembly errors to learn what type of error was committed.

For cells 4-6 of the design the above paragraph holds, but for the fourth and fifth number positions respectively.

Error coding for subassemblies:

0 No error
1
2
3
4
5 Most serious type of error

An example of Subject Coding--Data from Subject 30

30	3.1
0	1.3
21	3.1
4	1.16
10	2.28.6
3	1.37
17	1.1
181	1.1
868	5.1
0/1.1	2.6
3.3	3.3
2.1	4.6
1.1	1.1
1.1	1.1
2.1	1.1
1.1	1.3
1.1	1.2
1.3	1.28
1.3	1.1
1.3	1.3
1.1	3.10
2.3	10.5
1.3	2.18
1.3	1.1
1.3	1.4
1.3.10.2	1.61
1.11	1.8.7
1.10	1.3
1.2	2.3
1.10	2.5
1.1	1.3
1.19.11.2	1.14.8
1.1	1.2
1.1	1.121.9
2.1	1.7
1.3	1.14
1.2	1.8
1.14	1.12
1.55	1.3

2.1	1.4
1.7	1.73
0.0.3.0	1.3
0.0.4.0	1.1
2.8.5	1.5.1
1.1	2.1.2
1.2	1.15.12
1.1	1.3
2.2	1.6.13